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ABSTRACT

Teaching strategies that foster academic achievement for special and regular education students in the same classroom are crucial for successful student integration. One such approach is creativity training, which may aid all students in the development of concept mapping, a metacognitive strategy that allows students to integrate creative relationships between concepts. Training in concept mapping was completed by 120 rural West Virginia students in grades 5-7, comprising equal numbers of learning disabled, gifted, and regular education students. Half of each ability group then completed 10 hours of creativity training, while the rest received no further training. Across all three ability groups, experimental subjects who received creativity training scored significantly higher than control subjects in posttest concept mapping. A benefit of the creativity training intervention may be the development of metacognition strategies as measured by concept mapping. Students were encouraged during the training to be more fluent, flexible, original, and elaborative. Anecdotes about two learning disabled students who had completed the creativity training illustrate the positive impact of the training. (SV)

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Creativity Training-A Practical Teaching Strategy

During the past decade both regular and special educators have increasingly been challenged to integrate exceptional children into the regular classroom. Teaching strategies which foster academic achievement for special and regular education students in the same classroom are crucial for successful student integration.

Empowering exceptional children to learn more productively in the regular education classroom proposes a question of change in the traditional organization of curriculum. Mainstreaming is effective whenever regular classroom teachers are able to adapt instruction for their students, including those with mild handicaps (Madden and Slavin, 1983).

What strategies, then, might be appropriate for regular and special education students in the same educational setting? Research conducted by Jaben (1986b) with specific learning disabled students suggested creativity training might be one such strategy. Gowan (1965) theorized that creativity is a prerequisite for achievement. Baum and Owen (1988) investigated the characteristics that differentiate high ability learning disabled students from other students with learning disabilities and found creativity to be the distinguishing factor.

Gowan (1979) suggested that creativity is a prerequisite for achievement. He argued that the lack of achievement and poor motivation may be caused by deficiencies in creative ability. Jaben (1986a) found higher verbal written expression resulted from creativity training with students having specific learning disabilities. Getzels and Jackson (1962) affirmed that creative abilities are found to some extent in all people.

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Guilford (1968) suggested that the best working assumption to adopt is that education can do a great deal to promote the development of individuals in the way of preparing them to perform creatively. Parnes (1963) reported that creative imagination can be deliberately developed. He asserts that like most behavior, creative activity probably represents, to some extent, many learned skills.

Torrance (1963) listed the following four basic reasons for developing creative thinking: 1) creative thinking helps maintain good mental health and enhances personality development; 2) creative thinking may lead to the acquisition of new knowledge; 3) creative thinking may help in solving daily problems; and 4) creative thinking helps people of present and future generations to survive.

Novak and Gavin (1988) suggested concept mapping is a metacognitive strategy. While concept maps can be constructed in several ways, Novak, Gowin, and Johansen (1983) theorized, "The greatest creativity may be required to construct a concept map without any supplied words or text, but drawing on an individual's fund of knowledge for some specific topic" (p. 626). Thus, concept mapping is a metacognitive strategy which allows students to integrate creative relationships between concepts.

If it has been theorized creativity is related to concept map development, would creativity training impact the concept maps developed by students? It was hypothesized in this investigation that students who were classified as either specific learning disabled, regular education, or mentally gifted who received creativity training would score significantly higher on concept mapping than those within the same classifications who received no such creativity training. The purpose, then, of this study was to investigate the effects of creativity training upon the ability to produce more complex concept maps among 5th, 6th, and 7th grade students classified as learning disabled, regular education, or mentally gifted.

Methodology

One hundred twenty students from a rural middle school in north central West Virginia participated in the investigation. The subjects were randomly selected from intact classrooms and assigned to an

experimental or control group. The groups consisted of 20 experimental and 20 control subjects for each classification of learning disabled, regular education, and gifted.

All 120 subjects were given training in concept mapping and were asked to complete a concept map as a pretest. The three experimental groups were given 10 hours of creativity training while the three control groups received no creativity training. As a posttest measure, all 120 subjects completed a second concept map.

Data Analysis & Research Findings

Data were analyzed via an Analysis of Variance procedure with repeated measures. (Insert Table 1 about here.) Results indicated subjects who received creativity training developed significantly more complex concept maps than those subjects who received no such creativity training.

Across all three ability groups, experimental subjects who received creativity training scored significantly higher than control subjects in concept mapping. Thus, creativity training enhances the concept mapping ability of regular education students as well as students who are classified as specific learning disabled or mentally gifted.

Discussion

Results from this study suggest creativity training is an effective strategy for use in the regular classroom with both regular education students and students designated as learning disabled or mentally gifted. Thus, this technique is effective with integrated students in the regular education setting.

Given the need to develop strategies to facilitate the regular education initiative, creativity training is a technique that can be employed in an integrated classroom comprising of regular education students, students with learning disabilities, and students who are classified as mentally gifted. More importantly, it may be possible to teach creativity to all three groups at the same time. Emphasis should be placed on how students learn the content and not so much on the content itself. It should be recognized that these three groups will all start at different levels and should be evaluated on the progress made within each

Table 1
Summary of Analysis of Variance With Repeated Measures for Group X Ability X Test Results

SOURCE	df	SS	MS	F	PR>F
Group (A)	1	1358.50	1358.50	118.10	0.0001
Ability (B)	2	6130.42	3065.21	266.46	0.0001
A X B	2	72.16	86.08	7.48	0.001
Error between	114	3622.58	31.78		
Test (C)	1	940.10	940.10	81.72	0.0001
A X C	1	840.00	840.00	73.02	0.0001
B X C	2	24.01	12.00	1.04	0.355
A X B X C	2	41.01	20.50	1.78	0.17
Error within	114	1311.37	11.50		
Total	239	14,440.16			

group, not within groups.

A benefit of the creativity training intervention may be the development of metacognitive strategies as measured by concept mapping. Students were encouraged during the training to be more fluent, flexible, original, and elaborative. As the subjects developed their skills in each of these areas, they were given the opportunity to generalize their newly found ability to a tangible product. As students were encouraged to be more original, they developed creative ideas for expression that were unlike ideas from any other member of the training group.

For example, a student in the learning disability experimental group struggled with the brainstorming activity and became very frustrated when he was unable to produce a response. When prompted by the investigator that any response was acceptable and good, and that an original response was one that no one else had given, the subject gave an off the wall, but creative answer.

Two days later while working with foil, this student created a mouse and a mouse trap. When this product was shown to one of his teachers, she was astonished that he could create such an intricate product from a sheet of aluminum foil. She stated that he was the slowest and most limited child in the learning disabilities program, and she felt he should be classified as mild mentally impaired. She further stated that this child could barely read on the first grade level. Yet he was able, with prompting, to create something useful out of something not so useful by building upon the strategies taught to him in creativity training.

Summary

If indeed creativity training can impact concept mapping ability with both regular students and those students classified as mentally gifted or learning disabled, and these results are generalizable, then the argument for integrating exceptional students into the regular classroom using the same teaching strategies may have merit. Creativity training appears to be a strategy worthy of use by teachers with students in an integrated setting.

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